OPERATING SUMMARY

GODERICH

WATER SUPPLY SYSTEM

1973

Ontario

MINISTRY OF THE ENVIRONMENT

MINISTER
Honourable William G. Newman

DEPUTY MINISTER
E. Biggs

ASSISTANT DEPUTY MINISTER
REGIONAL OPERATIONS
J. Barr

REGIONAL OPERATIONS DIVISION

DIRECTOR, SOUTHWESTERN REGION
D. McTavish

MANAGER, UTILITY OPERATIONS
A. Ladbrooke

GODERICH

WATER SUPPLY SYSTEM

Operated for the

TOWN OF GODERICH
by the
MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
T. Cross, Director

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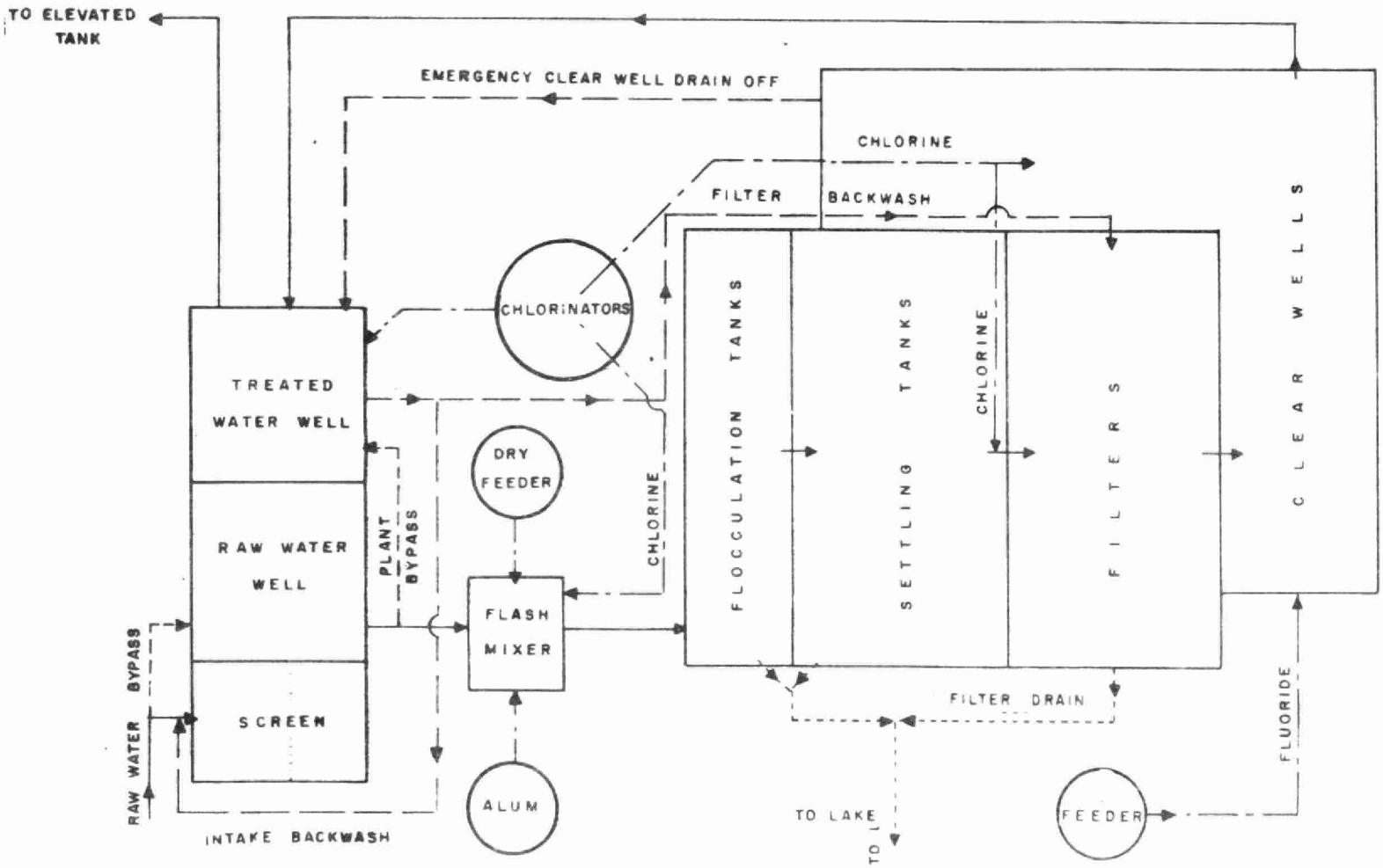
TOWN OF GODERICH

WATER TREATMENT PLANT



DESIGN DATA

PROJECT Town of Goderich WTP

PROJECT NO. 6-0069-60

NOMINAL CAPACITY

1.5 mgd

RAW WATER SOURCE

Lake Huron

INTAKE

Rock-filled timber crib with cover plate.
Min water depth -
above bellmouth 15.25'
above crib 13.00'
Pipe: 1600 ft of 30" dia concrete
Capacity: 6.4 mgd @ 2.44 fps

SCREENING

Type: Link-Belt travelling screen
3/8" opening
Size: One 3" wide x 23' deep -

LOW LIFT PUMPS

#1 - 0.95 mgd @ 6.7' head
#2 - 1.60 mgd @ 6.7' head
#3 - 1.60 mgd @ 6.7' head

FLASH MIXING

Chamber size: One 7.67' x 7.67' x 8.50'
Volume: 500 ft^2 or 3125 gal
Detention: 3.1 min @ 1.5 mgd
Mixer: 'Lightnin" with 30" dia propeller 84 rpm

FLOCCULATION

Stuart-Carter walking beam flocculator mechanism
Tank Size: Two 14.5' x 20.5' x 15.7' deep
Total Volume: 9340 ft^3 or 58,400 gal
Detention: 56 min @ 1.5 mgd

SEDIMENTATION

Size: Two 61.5' x 20.5' x 7.5' deep
Volume: 19,100 ft^3 or 120,000 gal
Detention: 1.9 hr @ 1.5 mgd
Overflow: 590 gpd/ft^2

FILTRATION

Type: Dual media filters
Size: Four units 12' x 12'
Rate: 3.6 igpm/ft^2 @ 3 mgd
Backwash: 3470 igpm

CHLORINATION

One W & T 100 lb/day (prechlorination)
One W & T 10 lb/day (post chlorination)
One W & T 100 lb/day (standby)

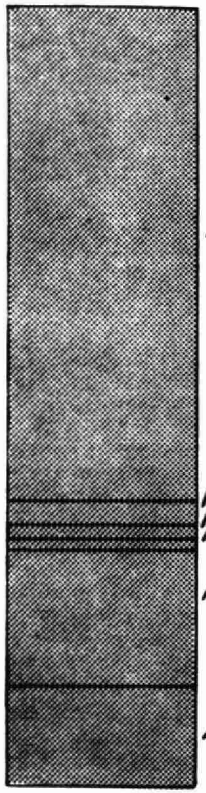
STORAGE

Clear wells - 24,000 gal
Reservoir - 91,400 gal
Town elevated tank - 200,000 gal
O.H. elevated tank - 250,000 gal

HIGH LIFT PUMPS

#4 - 0.75 mgd @ 315' head
#5 - 1.25 mgd @ 315' head
#6 - 1.25 mgd @ 315' head
Combined #4 & 5 or 6 2.00 mgd

ANNUAL COSTS



1973 OPERATING COSTS

SALARIES & WAGES	63 %
EMPLOYEE BENEFITS	3 %
TRANSPORTATION & COMMUNICATIONS	2 %
SERVICES	1 %
SUPPLIES & EQUIPMENT	18 %
AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	NIL
TRANSFER PAYMENTS	NIL
OTHER TRANSACTIONS	13 %

YEARLY OPERATING COSTS

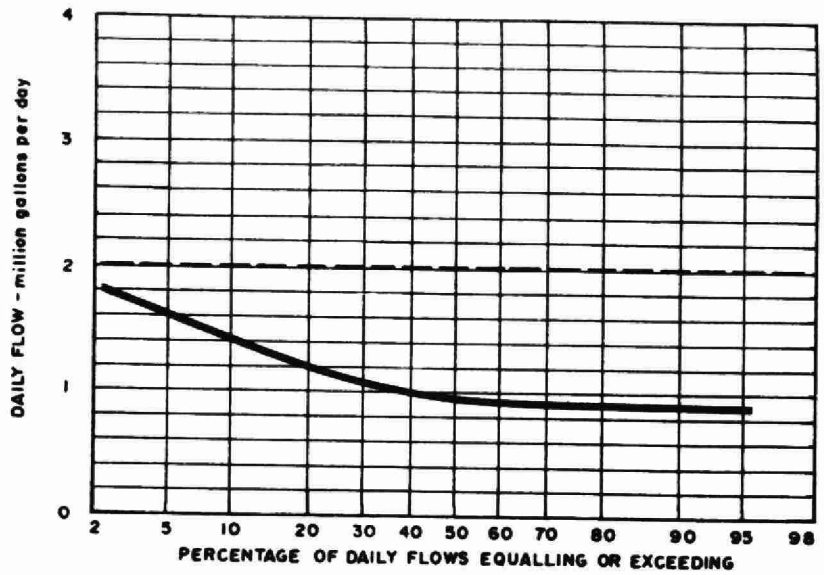
YEAR	WATER TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS cents per 1000 gal
1968	253	$53, 844	20
1969	286	59, 478	21
1970	306	64, 042	21
1971	338	70, 734	21
1972	384	77, 020	20
1973	392	80, 258	20

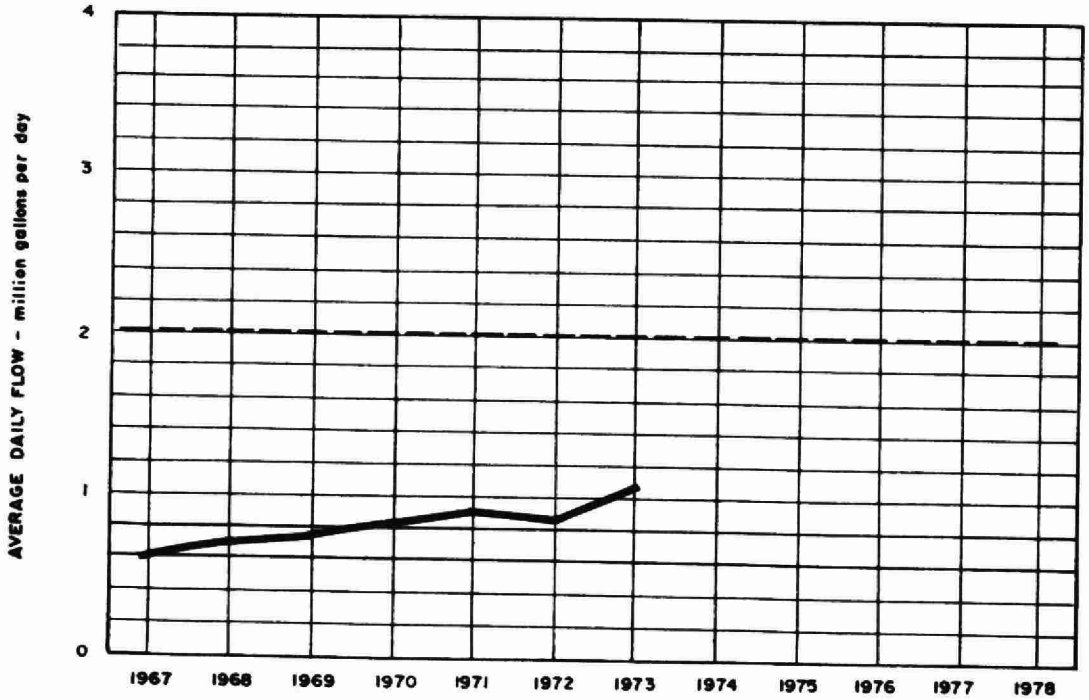
OPERATING EXPENDITURES

SALARIES AND WAGES	$50,596
EMPLOYEE BENEFITS	2,449
TRANSPORTATION & COMMUNICATIONS	1,741
SERVICES	453
SUPPLIES AND EQUIPMENT	14,372
ACQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	0
TRANSFER PAYMENTS	0
OTHER TRANSACTIONS	10,647
TOTAL	$80,258

PROCESS DATA

FLOWS





DESIGN CAPACITY _ _ _ _ _ _ _ _

PLANT PERFORMANCE

MONTH	FLOWS				RAW WATER		TREATED WATER					
							TURBIDITY		COLOUR		TEMPERATURE	
	TOTAL PLANT OUTPUT million gallons	AVERAGE DAILY FLOW million gallons	MAXIMUM DAY'S FLOW million gallons	MAXIMUM RATE mgd	TURBIDITY (AVERAGE) FTU	COLOUR (AVERAGE) App. units	AVERAGE FTU	MAXIMUM FTU	AVERAGE App. units	MAXIMUM App. units	AVERAGE °F	MAXIMUM °F
JAN	29.34	0.95	1.24	1.50	14.0	15	1.0	1.2	<5	<5	34	34
FEB	25.91	0.93	1.50	1.50	11.0	20	1.0	1.0	<5	<5	34	34
MAR	28.50	0.92	0.98	1.50	26.0	30	1.0	2.4	<5	5	36	40
APR	27.97	0.93	1.00	1.50	16.0	40	0.9	1.1	<5	<5	43	49
MAY	30.07	0.97	1.19	1.60	11.0	20	1.0	2.0	<5	<5	50	53
JUNE	34.85	1.16	1.65	2.50	4.7	<5	1.0	1.0	<5	<5	59	65
JULY	45.21	1.45	2.00	3.00	4.7	5	1.0	1.4	<5	5	65	71
AUG	40.51	1.31	1.56	2.50	8.0	70	1.2	1.0	<5	<5	69	77
SEPT	37.63	1.25	1.78	2.50	8.0	10	0.9	2.8	<5	<5	70	79
OCT	31.97	1.03	1.14	1.60	12.0	<5	1.1	1.1	<5	5	59	64
NOV	29.99	1.00	1.12	2.50	35.0	70	1.0	1.0	<5	<5	46	55
DEC	29.65	0.96	1.05	1.50	26.0		1.0	1.1			37	44
TOTAL	391.60											
AVG.		1.07	MAXIMUM 2.00	MAXIMUM 3.00	15.0	24	1.0	MAXIMUM 1.0	<5	MAXIMUM 5	50	MAXIMUM 79

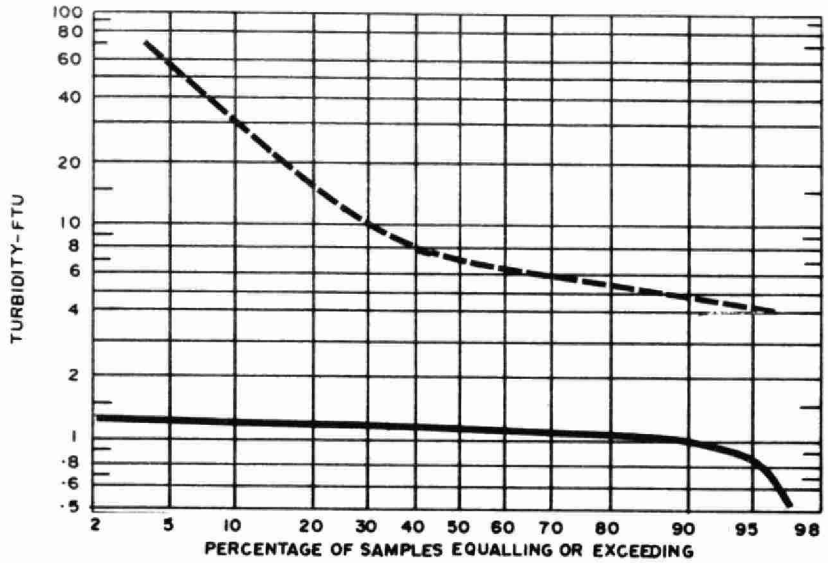
CHLORINATION and DISINFECTION

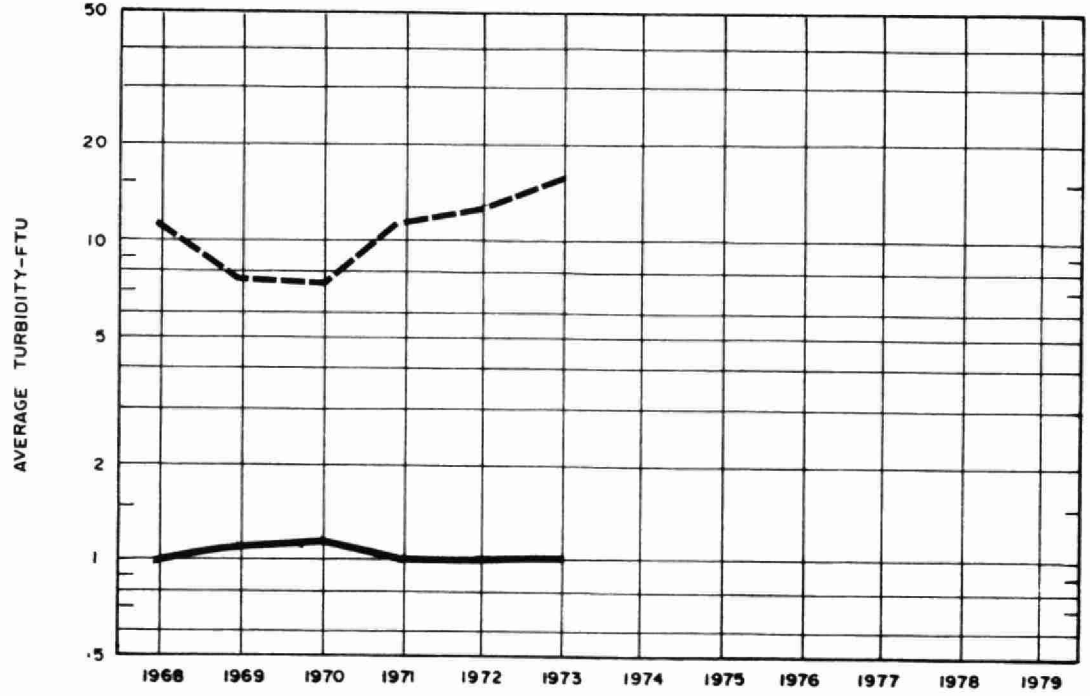
MONTH	RAW WATER					PLANT EFFLUENT		DISTRIBUTION SYSTEM		CHLORINATION			
	NUMBER OF SAMPLES HAVING TOTAL COLIFORM ORGANISMS PER 100 ml OF					NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	TOTAL AMOUNT OF CHLORINE USED pounds	DOSAGE		RESIDUAL IN PLANT EFFLUENT mg/l
	0	1 - 3	4 - 32	33 - 320	> 320						PRE - mg/l	POST - mg/l	
JAN	1	0	3	0	1	5	0	20	0	400	1.2	0.10	0.7
FEB	1	0	2	0	1	4	0	16	0	346	1.1	0.10	0.8
MAR	0	0	1	3	0	4	0	16	0	439	1.4	0.11	0.9
APR	1	1	1	1	0	4	0	16	0	419	1.3	0.11	1.0
MAY	3	0	1	0	0	4	0	16	0	487	1.4	0.13	0.9
JUNE	1	1	0	0	0	3	0	11	0	424	1.1	0.10	0.9
JULY	4	1	1	0	0	6	0	26	0	546	1.1	0.10	0.8
AUG	3	1	0	1	1	4	0	16	0	511	1.1	0.10	0.9
SEPT	1	1	1	1	0	4	0	16	0	505	1.2	0.11	0.9
OCT	1	2	1	0	1	5	0	21	0	423	1.2	0.13	1.0
NOV	0	0	1	3	0	4	0	16	0	377	1.1	0.12	1.0
DEC	1	0	2	1	0	4	0	16	0	389	1.2	0.13	1.0
TOTAL	17	7	14	10	4	51	0	206	0	5266			
AVG.	7 (NOTE - Average shown is the GEOMETRIC MEAN)									14 pounds per day	1.2	0.11	0.9

TREATMENT DATA

MONTH	FILTER OPERATION					CHEMICALS USED								
	AVG. APPLIED TURBIDITY FTU	FILTER RATE MAX. gpm/ft²	FILTER RATE AVG. gpm/ft²	AVG. FILTER RUN hours	BACKWASH WATER mil. gal.	ALUM AMT. USED gallons	ALUM DOSE mg/l	SOD. SILICATE AMT. USED gallons	SOD. SILICATE DOSE mg/l	SOD. BICARBONATE AMT. USED pounds	SOD. BICARBONATE DOSE mg/l	SODIUM SILICOFLUORIDE AMT. USED pounds	SODIUM SILICOFLUORIDE FLUORIDE LEVEL MAX. mg/l	SODIUM SILICOFLUORIDE FLUORIDE LEVEL MIN. mg/l
JAN	4.4	1.9	1.3	72	0.33	727	20	21	2.1	74	1.1	281	1.0	0.9
FEB	3.6	1.8	1.3	76	0.30	431	19	0		0		258	1.0	0.8
MAR	4.2	2.4	1.2	75	0.32	649	25	0		0		284	1.0	0.9
APR	3.8	1.8	1.2	68	0.36	929	21	0		0		277	1.1	0.9
MAY	3.3	3.0	1.3	61	0.44	969	21	15	2.1	53	1.1	308	1.1	0.9
JUNE	2.5	3.6	1.5	63	0.60	333	17	18	1.7	63	0.9	149	1.0	0.6
JULY	2.4	3.6	1.8	62	0.48	230	15	0		0		221	0.9	0.4
AUG	2.7	3.0	1.7	73	0.38	153	15	0		0		0		
SEPT	2.7	3.0	1.6	70	0.42	533	13	0		0		0		
OCT	2.7	1.9	1.4	65	0.42	701	14	0		0		0		
NOV	3.4	3.0	1.3	66	0.38	763	16	45	1.9	158	1.6	0		
DEC	3.4	1.8	1.2	64	0.42	956	21	63	2.1	220	1.1	107	1.2	0.6
TOTAL					4.49	7374	DAYS 257	162	DAYS 53	568	DAYS 53	1885	DAYS 208	
AVG.	3.3	3.6	1.4	68			18		2.0		1.1		MAX. 1.2	MIN 0.4

TURBIDITY





PLANT INFLUENT

PLANT EFFLUENT

WATER QUALITY

PROPERTY	RAW WATER				TREATED WATER				DESIRABLE STANDARDS
	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	
HARDNESS in mg/l as $CaCO_3$	12	123	154	96	29	127	180	96	80 – 100
ALKALINITY in mg/l as $CaCO_3$	12	107	137	77	29	88	136	62	30 – 100
IRON in mg/l Fe	12	1.14	5.20	0.05	29	< 0.05	0.70	< 0.05	Less than 0.3
CHLORIDE in mg/l Cl^-	12	10	19	7	29	12	23	6	Less than 250
pH in pH units	12	7.8	8.1	7.3	29	7.5	8.2	6.9	7.0 – 8.5
FLUORIDE in mg/l F^-	7	0.3	1.3	0.1	14	0.8	1.3	0.1	Less than 1.2